

Ma 9

3.2 Exponent Laws

IF the bases are the same, then we can combine exponents using these laws:

★ Multiplying → add the exponents

$$(x^2)(x^3) = x^5 \qquad (3^5)(3^2) = 3^7$$

★ Dividing → subtract the exponents

$$(x^7)(x^3) = x^4 \qquad (2^5)(2^3) = 2^2$$

★ Raising a power to an exponent → mult. the exponents

$$(x^2)^5 = x^{10} \qquad (5^3)^7 = 5^{21}$$

★ Raising anything to an exponent of 0 = 1

$$(x^2y^5)^0 = 1 \qquad (758^{14})^0 = 1$$

★ Remember exponents affect everything inside brackets, so:

$$(3 \cdot x)^5 = 3^5 \cdot x^5 \qquad \left(\frac{2}{3}\right)^2 = \frac{2^2}{3^2}$$

Examples

a) $4^3 \cdot 4^5 = 4^8$

b) $(-5)^2 \cdot (-5)^3 = (-5)^5$

$$c) 2^5 \div 2^4 = \frac{2^5}{2^4} = 2^1 = 2$$

$$d) \frac{(-3)^{10}}{(-3)^7} = (-3)^3$$

$$e) ((-3)^4)^3 = -3^{12}$$

$$f) (5 \times 4)^2 = 5^2 \cdot 4^2 \text{ or } = 20^2$$

$$g) \left(\frac{2}{5}\right)^5 = \frac{2^5}{5^5}$$

$$h) (-5)^0 = 1$$

$$i) -5^0 = -1$$

Try These:

$$a) 3^3 \cdot 3^7 = 3^{10}$$

$$b) \frac{2^5}{2^2} = 2^3$$

$$c) \frac{5^2 \cdot 5^6}{5^3} = 5^5$$

$$d) \left(\frac{2}{3}\right)^2 = \frac{2^2}{3^2}$$

$$e) \left(\frac{5^3}{7^2}\right)^4 = \frac{5^{12}}{7^{24}}$$

$$f) \left(\frac{5^2 \cdot 5^7 \cdot 5^3}{5^9}\right)^0 = 1$$

Practice:

pg 105 #1-17,
21, 22

If finish, create
some questions you'd
like to see on a
quiz or test :)